

(19) World Intellectual Property  
Organization  
International Bureau



(43) International Publication Date  
9 June 2005 (09.06.2005)

PCT

(10) International Publication Number  
WO 2005/053356 A1

(51) International Patent Classification<sup>7</sup>: H04R 17/00,  
5/02, H01L 41/09

(21) International Application Number:  
PCT/GB2004/004735

(22) International Filing Date:  
10 November 2004 (10.11.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
0326721.8 17 November 2003 (17.11.2003) GB  
0417277.1 3 August 2004 (03.08.2004) GB

(71) Applicant (for all designated States except US): 1...  
LIMITED [GB/GB]; St John's Innovation Centre, Cowley  
Road, Cambridge CB4 0WS (GB).

(72) Inventors; and

(75) Inventors/Applicants (for US only): TOPLISS, Richard  
[GB/GB]; 43 Bishops Road, Trumpington, Cambridge CB2  
2NQ (GB). HOOLEY, Anthony [GB/GB]; 79 De Freville  
Avenue, Cambridge CB4 1HP (GB). SHEPHERD, Mark,

Richard [GB/GB]; Clare House, 124 High Street, Mel-  
deth, Royston, Herts SG8 6BL (GB).

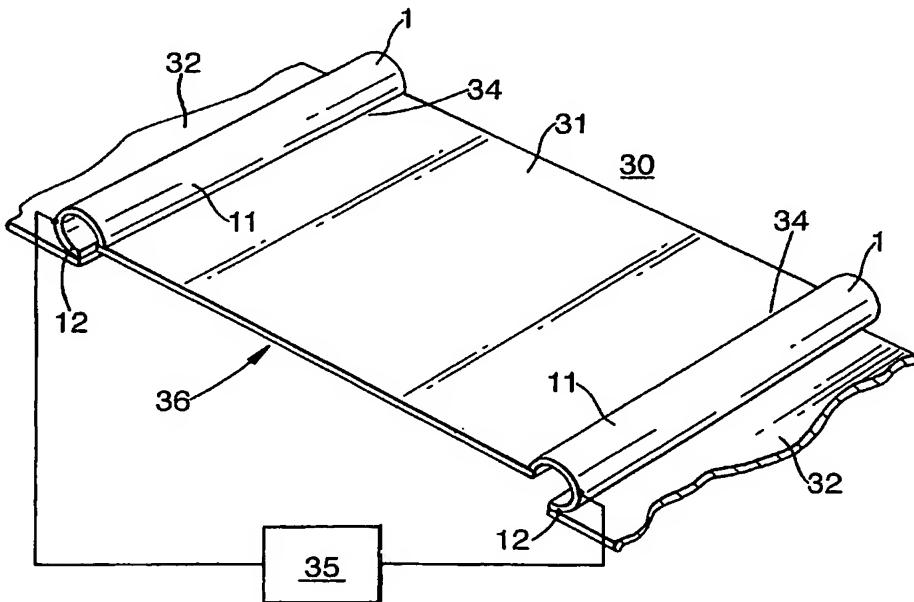
(74) Agents: MERRYWEATHER, Colin, Henry et al.; J.A.  
Kemp & Co., 14 South Square, Gray's Inn, London WC1R  
5JJ (GB).

(81) Designated States (unless otherwise indicated, for every  
kind of national protection available): AE, AG, AL, AM,  
AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN,  
CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI,  
GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE,  
KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD,  
MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG,  
PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM,  
TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM,  
ZW.

(84) Designated States (unless otherwise indicated, for every  
kind of regional protection available): ARIPO (BW, GH,  
GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM,  
ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),  
European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI,  
FR, GB, GR, HU, IE, IS, IT, LU, MC, NL, PL, PT, RO, SE,  
SE, ZW).

[Continued on next page]

(54) Title: LOUDSPEAKER



(57) Abstract: A loudspeaker (30) comprises a sound generating element (31) mounted on a support structure (32), and two rotary actuators (12) mounted at opposing edges (34) of the sound generating element (31). The actuators (12) are operable to drive motion of the sound generating element (31) relative to the support structure (32) including a component of rotation. The loudspeaker (30) produces a greater sound output than if driven at one edge only, and is particularly suitable for use in a portable electronic device such as a mobile telephone, in which case the support structure (32) may be a portion of the casing of the device and the sound generating element (31) may be a transparent panel covering a display device (33).

WO 2005/053356 A1



SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ,  
GW, ML, MR, NE, SN, TD, TG).

*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

**Published:**

— *with international search report*